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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/614,418	07/03/2003	Cem Basceri	MICRON.098DV2	7429

20995                      7590                      11/26/2003

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EXAMINER

HA, NGUYEN T

ART UNIT

PAPER NUMBER

2831

DATE MAILED: 11/26/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/614,418

Applicant(s)

BASCERI ET AL.

Examiner

Nguyen T Ha

Art Unit

2831

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 03 July 2003 and 20 October 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-5 is/are allowed.
- 6) ☒ Claim(s) 6, 8-10, 12 and 17-19 is/are rejected.
- 7) ☒ Claim(s) 7, 11 and 13-16 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 00.
- 4) ☐ Interview Summary (PTO-413) Paper No(s): \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 6 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Summerfelt et al. (US 5,581,436).

Regarding claim 6, Summerfelt et al. disclose a capacitor structure (figure 7) comprising:

- a base layer/substrate (30);
- a first nucleation layer/insulating layer (32) formed over the base layer;
- a bottom electrode (34) formed over the nucleation layer;
- a second nucleation layer/uncreative film (36) formed over the bottom electrode;
- a BST film (38) formed over the second nucleation layer (the barium strontium titanate or BST is an crystal); and
- a top electrode (42) formed over the BST film.

Regarding claim 9, Summerfelt et al. disclose the second nucleation layer being made of a material selected from a group including platinum (column 6, line 47).

3. Claims 12 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Fujii et al. (US 5,406,445).

Regarding claim 12, Fujii et al. disclose a capacitor structure (figure 1) comprising:

- a base layer/substrate (1);
- a bottom electrode (2) formed over the base layer;
- a layer (3) made of a metal formed over the bottom electrode;
- a BST film (4) formed over the first nucleation layer, (the barium strontium titanate or BST is an crystal); and
- a top electrode (5) formed over the BST film.

Regarding claim 17, Fujii et al. disclose the base layer/substrate comprises polysilicon (column 4, line 57).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Summerfelt et al. (US 5,581,436) in view of Azuma (US 5,822,175).

Regarding claim 8, Summerfelt et al. disclose all the limitations discussed above with respect to claim 6, except for the bottom electrode being made from a material selected from a group consisting of Pt, Ru, Ir, IrOx, RuOx, Pt-Rh, Mo and Pd.

**Azuma teaches** a bottom electrode being selected from a group of materials including Platinum (column 4, lines 27-29).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the Azuma bottom electrode into Summerfelt in order to increase the capacitance and conductivity for the capacitor.

Regarding claim 10, Summerfelt et al. disclose all the limitations discussed above with respect to claim 6, except for the top electrode being made from a material selected from a group of materials consisting of Pt, Ru, Ir, IrOx, RuOx, Pt-Rh, Mo and Pd.

**Azuma teaches** a top electrode being selected from a group of materials including Platinum (column 4, lines 57-58).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the Azuma top electrode into Summerfelt in order to increase the capacitance and conductivity for the capacitor.

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6. Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujii et al. (US 5,406,445) in view of Azuma (US 5,822,175).

Regarding claim 18, Fujii et al. disclose all the limitations discussed above with respect to claim 12, except for the bottom electrode being made of a material selected from the group consisting of Pt, Ru, Ir, IrOx, RuOx, Pt-Rh, Mo and Pd.

**Azuma teaches** a bottom electrode being selected from a group of materials including Platinum (column 4, lines 27-29).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the Azuma bottom electrode into Fujii in order to increase the capacitance and conductivity for the capacitor.

Regarding claim 19, Fujii et al. disclose all the limitations discussed above with respect to claim 12, except for the top electrode being selected from the group of materials consisting of Pt, Ru, Ir, IrOx, RuOx, Pt-Rh, Mo and Pd.

**Azuma teaches** a top electrode being selected from a group of materials including Platinum (column 4, lines 57-58).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the Azuma top electrode into Fujii in order to increase the capacitance and conductivity for the capacitor.

***Allowable Subject Matter***

7. Claims 1-5 are allowed.

The following is an examiner's statement of reasons for allowance:

With respect to claims 1-5, the prior art alone or in combination does not teach the limitation of a capacitor comprising a BST film, wherein the BST film comprises between about 50 and 53.5 atomic percent titanium.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

8. Claims 7, 11 and 13-16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

With respect to claim 7, the prior art alone or in combination does not teach the limitation of a first nucleation layer is made of NiO.

With respect to claim 11, the prior art alone or in combination does not teach the limitation of a BST film comprises about 52-53 atomic percent titanium.

With respect to claim 13, the prior art alone or in combination does not teach the limitation of a first nucleation layer is a material selected from the group consisting of Ti, Nb.

With respect to claim 14, the prior art alone or in combination does not teach the limitation of a BST film comprises about 50 and 53.5 atomic percent titanium.

With respect to claims 15&16, the prior art alone or in combination does not teach the limitation of a second nucleation layer between the base layer and the bottom electrode, wherein the second nucleation layer is made of NiO.

**Citation Relevant of Prior Art**

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. Farooq et al. disclose a thin film capacitor on ceramic.
- b. Maniar discloses a capacitor having a ruthenate electrode and method of formation.

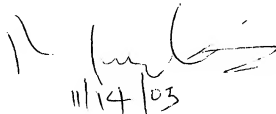
**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nguyen T Ha whose telephone number is 703-308-6023. The examiner can normally be reached on Monday-Friday from 8:30AM to 6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dean Reichard can be reached on 703-308-3682. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

NH  
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